DETAILED ACTION

1. Claims 1-10 are pending.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1, 2, and 8-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sho (US Patent Application Publication 2003/0099178), in view of Ohmori (US Patent 6,967,978).

Regarding claims 1 and 8-10, Sho disclose an optical disk apparatus for performing a data write and/or read operation with respect to an information recording layer of an optical disk, comprising:

an optical head for radiating light toward the optical disk (inherent in ¶s 22 and 23), and

generating and outputting a servo signal based on light reflected from the information recording layer (inherent in ¶s 22 and 33 for the purpose of providing the optical disk apparatus with the functionality to "record data on the optical disc 1 or to reproduce data recorded on the optical disc 1");

a control signal generating section for generating a control signal for controlling a position of a focal point of the light based on the servo signal output from the optical head (inherent in ¶s 22 and 33 for the purpose of providing the optical disk apparatus with the functionality to "record data on the optical disc 1 or to reproduce data recorded on the optical disc 1"); and

a driving circuit for generating a driving signal based on the control signal (inherent in ¶s 22 and 33 for the purpose of providing the optical disk apparatus with the functionality to "record data on the optical disc 1 or to reproduce data recorded on the optical disc 1"),

wherein the optical head includes:

a laser (element 11 in figure 3);

a laser driving device for supplying a driving current for causing the laser to emit light (element 15 in figure 3);

an objective lens for converging light from the laser onto the information recording layer (element 13 in figure 3);

an actuator for adjusting a position of the objective lens based on the driving signal (inherent in figure 3 and ¶s 22 and 33 for the purpose of maintaining the proper positioning of element 13 with respect to element 1 to aid in providing the optical disk apparatus with the functionality to "record data on the optical disc 1 or to reproduce data recorded on the optical disc 1"); and

a light-receiving section for receiving light reflected from the information recording layer and for outputting a signal which is in accordance with the amount of light (element 14 in figure 3),

wherein the laser driving device (which performs a laser driving method) includes:

a laser driving section for supplying a driving current for causing the laser to emit light (element 15b in figure 3 and ¶s 33 and 34);

a temperature detecting section for detecting a temperature of the laser (element 40 in figure 3 and ¶s 33 and 34); and

a voltage control section for supplying a source voltage to the laser driving section while changing a voltage value of the source voltage in accordance with the temperature detected by the temperature detecting section (element 16 in figure 3 and ¶s 33 and 34),

wherein the laser driving section and the laser become operable with supply of the source voltage supplied to one end of one of the laser driving section and the laser (¶ 34), and

wherein the laser driving section supplies the driving current based on an instruction value which is different from the voltage value of the source

voltage (the "error signal" output from element 15a and input to element 15b in figure 3 and ¶ 26 is different from the voltage value supplied to element 15b by element 16).

However, Sho fails to explicitly disclose where the laser driving section and the laser are connected in series and the voltage control section controls the voltage value of the source voltage so that the voltage value at a first temperature becomes lower than the voltage value at a second temperature which is lower than the first temperature.

In the same field of endeavor, Ohmori discloses where the laser driving section and the laser are connected in series (note where element 11 is in series with element LD in figures 1 and 4) and the voltage control section controls the voltage value of the source voltage so that the voltage value at a first temperature becomes lower than the voltage value at a second temperature which is lower than the first temperature (col. 17, lines 29-55).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the apparatus of Sho with that of Ohmori, for the purpose of maintaining a constant light intensity despite the temperature of a laser diode changing while in operation (col. 13, line 65 through col. 14, line 4).

Regarding claim 2, Sho, in view of Ohmori, discloses everything claimed, as applied to claim 1. Additionally, Sho discloses where the laser driving device further comprises a power control section for causing the laser to emit the light with a predetermined emission power by controlling the instruction value for the laser driving section so as to adjust the driving current supplied from the laser driving section (elements 15a in figure 3 and ¶s 33 and 34; where element 15a adjusts the driving current by supplying the error signal to element 15b).

4. Claims 3-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sho, in view of Ohmori, and further in view of applicant's admitted prior art (hereinafter the AAPA).

Regarding claim 3, Sho, in view of Ohmori, discloses everything claimed, as applied to claim 2. However, Sho, in view of Ohmori, fails to disclose where the laser driving device further comprises a

setting section for instructing a setting of a reference voltage in accordance with an amount of light to be emitted by the laser.

In the same field of endeavor, the AAPA discloses where the laser driving device further comprises a setting section for instructing a setting of a reference voltage in accordance with an amount of light to be emitted by the laser (element 306 in figure 3 and ¶ 12).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the apparatus of Sho, as modified by Ohmori, with that of the AAPA, for the purpose of appropriately controlling the emission power of a semiconductor laser for either reproducing or recording information from or on a recording medium (¶ 14).

Regarding claim 4, Sho, in view of Ohmori and the AAPA, discloses everything claimed, as applied to claim 3. Additionally, Sho discloses where the laser driving device further comprises an emission power detecting section for detecting a value which is in accordance with the emission power of the laser and for outputting a signal corresponding to the value (element 14 in figure 3 and ¶ 24; where element 14 outputs a signal at least proportional to detected light emitted by element 11), wherein the power control section controls an instruction value to the laser driving section based on an electrical characteristic of the signal output from the emission power detecting section, and a reference electrical characteristic, in such a manner that the electrical characteristic of the signal equals the reference electrical characteristic (¶ 25).

However, Sho fails to explicitly disclose where the electrical characteristic and the reference electrical characteristic consist of a voltage and a reference voltage, respectively.

In the same field of endeavor, Ohmori discloses where the electrical characteristic and the reference electrical characteristic consist of a voltage and a reference voltage, respectively (Vdet and Vref, respectively, in figure 1 and col. 8, lines 1-59).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the apparatus of Sho, with that of Ohmori, for the purpose of correcting errors in the output intensity of a driven laser diode (col. 8, lines 1-59).

Regarding claim 5, Sho, in view of Ohmori and the AAPA, discloses everything claimed, as applied to claim 4. Additionally, Sho discloses where characteristics between an operating voltage, which is necessary for the laser to operate, and the driving current differ depending on temperature (figure 7 shows where increases in the temperature of the laser cause increases in the current required to emit the same amount of light and ¶s 33 and 34 disclose where the voltage is adjusted to compensate for the increased power consumption caused by the increased current, which has been caused by the increased temperature of the laser); and the voltage control section determines the voltage value of the source voltage based on the driving current and the characteristics (¶s 33 and 34). Note where Ohmori also discloses this in col. 17, lines 29-55.

Regarding claim 6, Sho, in view of Ohmori and the AAPA, discloses everything claimed, as applied to claim 5. However, Sho fails to disclose where the operating voltage increases as the temperature decreases and the voltage control section supplies a higher source voltage as the temperature decreases.

In the same field of endeavor, Ohmori discloses where the operating voltage increases as the temperature decreases and the voltage control section supplies a higher source voltage as the temperature decreases (col. 17, lines 29-55).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the apparatus of Sho with that of Ohmori, for the purpose of maintaining a constant light intensity despite the temperature of a laser diode changing while in operation (col. 13, line 65 through col. 14, line 4).

5. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sho, in view of Ohmori, and further in view of Matsushita et al ("A Blue-Violet Laser for Optical Disc", by Toshio Matsushita et al., OPTRONICS, 2003 May issue, pp. 120-123; hereinafter Matsushita).

Note: the aforementioned reference to Matsushita was cited by applicant in the Information Disclosure Statement filed 05 May 2006 under "Other Art".

Regarding claim 7, Sho discloses everything claimed, as applied to claim 1. However, Sho fails to disclose a wavelength of the light emitted by the laser.

In the same field of endeavor, Matsushita discloses where the laser driving section outputs the driving current for causing a laser whose wavelength is within a range from 400 nm to 430 nm to emit light (the paragraph immediately following the box with the number "2" in it in column 1 on page 120, in combination with the paragraph in the second column of page 123 that is entirely in English).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the apparatus of Sho with that of Matsushita, for the purpose of recording/reproducing information on/from Blu-ray discs (the paragraph in the second column of page 123 that is entirely in English).

Relevant Prior Art

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

   a. Ikeuchi et al (US Patent 5,563,898) disclose a temperature sensing circuit for use in controlling at least the drive current for a laser diode (see at least figure 2 and the related portions of the disclosure).

Response to Arguments

7. Applicant's arguments with respect to claims 1 and 8-10 have been considered but are moot in view of the new ground(s) of rejection.

Closing Remarks/Comments

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date

of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nathan A. Danielsen whose telephone number is (571)272-4248. The examiner can normally be reached on Monday-Friday, 9:00 AM - 5:00 PM Eastern Time.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wayne Young can be reached at (571) 272-4808. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/ND/
04/15/2010

/Wayne Young/
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